

Abstract

The present invention discloses an isolated polynucleotide encoding a gene product having tricothecene resistance activity that thereby confers tricothecene resistance to transgenic plants, plant tissues, plant seeds, and plant cells. Tricothecene resistance activity, as used herein, refers to an activity that reduces or inhibits the phytotoxicity of a tricothecene, particularly to a fungus and/or plant. In a particular embodiment, tricothecene resistance activity refers to an activity that transfers an acetate to the C-3 position of a tricothecene such as T-2 toxin, HT-2 toxin, isotrichodermol, diacetoxyscirpenol ("DAS"), 3-deacetylcalonectrin, 3,15-dideacetylcalonectrin, scirpentriol, neosolaniol; 15-acetyldeoxynivalenol, nivalenol, 4-acetylnivalenol (fusarenone-X), 4,15-diacetylnivalenol, 4,7,15-acetylnivalenol, and deoxynivalenol ("DON") and their various acetylated derivatives. In another particular embodiment, the gene product having trichthecene resistance activity is a 3-O-acetyltransferase from a tricothecene-producing species of *Fusarium*, such as *Fusarium graminearum* or *Fusarium sporotrichioides*.